

# SCARABAEIDAE (COLEOPTERA) FROM THE HARRINGTON DISTRICT OF COASTAL NORTHERN NEW SOUTH WALES, WITH SPECIAL REFERENCE TO A LITTORAL RAINFOREST HABITAT

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## Abstract

Data are tabulated on habitat preference and periods of occurrence for 57 species of Scarabaeidae collected. Two new distribution records are noted for the rarely encountered ruteline, *Anoplognathus viridiaeneus* (Donovan). Significant range extensions are listed for species associated primarily with rainforest at Harrington, and the fragility and depauperate status of this habitat is noted.

## Introduction

The township of Harrington is situated approximately 360 km by road north of Sydney, near Taree on the New South Wales coast.

Extensive dairying and pastoral areas lie to the west, separated from the town by a narrow zone of mixed *Eucalyptus* woodland-heath communities extending down from the Crowdy Bay National Park. Wetlands occur intermittently throughout the coastal plain, and small pockets of a depauperate littoral rainforest system are to be found in the lee of coastal sand dunes between Harrington and Crowdy Head 7 km to the north. Sandy soil types predominate throughout the collecting area.

The rainforest patches now remaining at Harrington after sand mining operations in the 1960's range in area from approximately 0.5 - 2.0 ha and have suffered extensively from salt burn caused by canopy disruption and sporadic inundation from dunal movement. Further habitat destruction resulting from pedestrian access and vandalism is localized but, with rainforest areas of such small size, it is significant. Areas of open woodland to the immediate west of the township suffered from bushfires in October 1976 and more extensively in February 1977.

Collecting was undertaken from late 1970 to January 1978. Regular monthly visits were begun in August 1976 when frequent pit trapping was carried out until the end of 1977. The technique of Matthews (1972) for the pit fall trapping of dung-attracted Coleoptera proved invaluable in ascertaining the district's scarabaeine, hybosorine and aphodiine fauna. Traps were baited either with human faeces or mushrooms. As the bait material often adhered to captured beetles, making field identification difficult, it was found desirable to enclose the bait in small cloth bags. These bags were sewn to a finished size of approximately 140 mm x 100 mm although the bag size was varied to match the trap cup size used. Some difficulty was experienced in inserting faecal material into a bag size of less than 100 mm in width. After placing the bait in bags the latter were tied off with thread about one third the way down from the open end, forming a roughly gathered area of cloth. When placed upside down into the trap cup this gathered cloth afforded the attracted Coleoptera a degree of protection from small forest predators, especially Carabidae, which in wet

forest habitats often enter traps. Lawn type materials, or light synthetics used in curtain making, were used to make the bags. Other collecting techniques included plant and blossom observation, sweep-netting, observation of town lights and tide marks (Williams, 1976). A 20 watt 12 volt "black" light operated from a standard vehicle battery, was also utilized for the collection of species attracted to light.

Field notes of numbers collected provided an assessment of the abundance of each species encountered. In the following list "rare" indicates fewer than three specimens, "few" means three to ten specimens, and "common", more than ten specimens taken over the period of collection. Though "rareness" may be only a reflection of astuteness in observation, and not necessarily indicative of a species actual abundance, the need for such an assessment cannot be avoided.

### List of species

#### APHODIINAE

*Aphodius granarius* Linnaeus—Nov.-Dec.; common at town lights.

*Aphodius lividus* Olivier—Nov.-Dec.; common at town lights, pasture and woodland.

*Ataenius imparilis* Blackburn—Nov.; rare on tide marks.

*Ataenius macilentus* Blackburn—Nov.; few at border of pasture and *Casuarina* swamp at light.

*Ataenius tweedensis* Blackburn—Oct., Feb.; common at light in heathland and woodland.

#### HYBOSORINAE

*Liparochnrus bimaculatus* Westwood—Aug., Nov.-May; common at human faeces, rotting molluscs and fish in rainforest.

#### SCARABAEINAE

*Onthophagus capella* Kirby—Sept., Dec., Apr.; common at faeces and cowdung in woodland and pasture, rare on tide marks.

*Onthophagus tabellifer* Gillet—Sept.-Apr.; few in rainforest at human faeces. With the exception of one isolated individual in April males were only taken during December and January.

*Onthophagus nurubuan* Matthews—Sept., Oct., Dec., Apr., May; common at cowdung; rare at faeces in woodland-heath complexes.

*Onthophagus auritus* Erickson—Sept., May; few at faeces in woodland-heath complex.

*Onthophagus waterhousei* Boucomont and Gillet—Sept., Nov., Dec.; few at faeces in woodland-heath complex.

*Onthophagus rubicundulus* Macleay—Sept., Dec.-Feb., Apr.; common in rainforest; rarely (Sept.) in woodland-heath at faeces.

*Onthophagus granulatus* (Bohem)—Oct.; common in pasture.

*Onthophagus depressus* Harold—Nov.-Feb., Apr.; few at lights, faeces and cowdung in pasture, town area, woodland and *Melaleuca* swamp.

*Diorygopyx asciculifer* Matthews—Sept.-Aug.; common in rainforest at mushrooms, faeces and rotting fish.

*Lepanus australis* Matthews—Aug.-Mar.; common at faeces and fishbones, rare at mushrooms in rainforest.

*Notopodaria metallica* Carter—Dec., Mar., Apr.; common (Dec.) at faeces in rainforest.

#### RUTELINAE

*Repsimus manicatus manicatus* (Swartz)—Nov., Dec.; common at town lights and by day on

*Leptospermum* spp., common at tide marks, few at light adjoining rainforest.

*Repsimus aeneus* (Fabricius)—Dec.; common at lights, rare on tide marks.

*Anoplognathus cloropyrus* (Drapiez)—Dec.; common at tide marks and light in *Eucalyptus* woodland.

*Anoplognathus olivieri* (Dalman)—Nov.-Feb.; common at lights in woodland & on tide marks.

*Anoplognathus pallidicollis* Blanchard—Dec., Jan.; common on tide marks.

- Anoplognathus porosus* (Dalman)—Nov., Dec.; common at lights and tide marks.  
*Anoplognathus viridiaeneus* (Donovan)—Dec.; rare at tide marks.  
*Paraschizognathus ocellaris* Carne—Oct., Nov.; common in pasture or woodland adjoining *Casuarina* and *Melaleuca* swamps; flying after dusk; at lights.

## CETONIINAE

- Diaphonia dorsalis* Donovan—Dec., Jan.; common in flight by day, few at tide marks.  
*Eupoecila australasiae* (Donovan)—Jan.; larva breeding in driftwood at river mouth; few.

## DYNASTINAE

- Cheiroplatys latipes* (Guerin)—Sept., Dec., Jan.; common at light in woodland, few at town lights and rarely (Sept.) in rainforest.  
*Cheiroplatys solidus* Carne—Jan.; rare, dead on beach dune.  
*Dipelicus duplex* (Sharp)—Sept., Nov., Feb., Mar.; common at town light near dune system.  
*Heteronchys arator* (Fabricius)—Sept.-Nov., Feb., Mar.; common at lights, *Eucalyptus* woodland, pasture and lawn areas, few at tide marks.  
*Metanastes vulgivagus* (Olliff)—Oct., Nov., Jan., Feb.; common on tide marks and in association with *Heteronchys arator* (F.) at light in woodland-pasture areas; rare at town lights.  
*Pimelopus dubius dubius* Blackburn—Dec.-Mar.; few at light, rainforest and heathland; rare in woodland.  
*Pimelopus porcellus crassus* Blackburn—Nov., Jan.; rare at town light near dune system.  
*Cryptodus* sp. near *passaloides* Germar—Jan.; rare at light adjoining rainforest.

## MELOLONTHINAE

- Automolius humilis* (Blanchard)—Dec.; rare on tide marks.  
*Automolius valgoideus* Blanchard—Oct., Nov.; common on *Leptospermum* blossom in heath-woodland complex.  
*Haploopsis* ?sp. n., near *rutila* Britton—Dec., Jan.; few at light in rainforest.  
*Heteronyx* spp (four species)—Aug.-Feb.; common at town lights, heath, rainforest, tide marks and woodland.  
*Neoheteronyx* sp.—Dec.; rare at town light.  
*Maechidius emerginatus* Waterhouse—Dec.; rare on tide marks.  
*Maechidius stradbrokeensis* Lea—Feb.; few at light in heathland; rare at light in rainforest.  
*Phyllotocus basalis* Lea—Dec.; rare on tide marks, few at light adjoining rainforest.  
*Phyllotocus macleayi* Fisher—Dec.; rarely at town lights and tide marks.  
*Phyllotocus scutellaris* Macleay—Oct., Nov.; few on *Leptospermum* spp in heath-woodland complex.  
*Rhopaea verreauxi* Blanchard—Dec.; rare on tide marks.  
*Sericesthis geminata* Boisduval—Nov., Dec.; few at town lights; common on tide marks.  
*Sericesthis antennalis* Blackburn—Nov.; rare at light on pasture-*Casuarina* swamp border.  
*Sericesthis accola* Britton—Nov.; rare at light on pasture-*Casuarina* swamp border.  
*Sericesthis nigrolineata* Boisduval—Nov., Dec.; common on tide marks.  
*Scitula aureorufa* Blanchard—Oct., Nov.; at light adjoining rainforest, heath and woodland; common.  
*Diphucephala* sp.—Oct.; rare in *Eucalyptus* woodland.  
*Diphucephala* sp.—Oct.; few in heathland.  
*Liparetrus discipennis* Guerin—Oct.; few on *Leptospermum* blossom in woodland.

## Discussion

As previously stated, the heath-woodland communities were burnt out in October 1976 and February 1977, the last fire burning all herbaceous and shrub cover in the study area. *Leptospermum*, in particular, suffered from the latter fire; very few plants had begun to regenerate by December 1977. *Xanthorrhoea* dominated the flowering species in the spring following the February fire in much of the woodland habitat where previously it had been unnoticeable amongst the



*Leptospermum* that normally predominated. Heavy rain inundated the area for two lengthy periods in the first half of 1977, stagnant water expanses covering the collection sites for months at a time.

*Ataenius imparalis*, *Automolius humilis*, *Anoplognathus viridiaeneus*, *A. pallidicollis*, *Rhopaea verreauxi*, *Maechidius emarginatus* and *Sericesthis nigroliteata* were represented by specimens found only at beach tide marks and the usefulness of this collecting zone cannot be overlooked. The occurrence of Coleoptera at Harrington on tide marks could not be associated with any apparent temperature or wind condition or interaction. It would seem that specimens land accidentally or are forced to do so by exhaustion or strong wind on the water, and tides then concentrate them along tidal zones (Williams, 1976).

Cetoniinae are poorly represented in the species list, although a number of undetermined species were noted in flight; the difficulty of collecting this subfamily has been well documented by Lea (1914).

A number of significant distribution extensions have resulted from the Harrington study, mainly of species associated with the littoral rainforest in the area. These records are listed below. For the interest of readers the previously published distribution or nearest published locality for each species is noted. For more definitive distributions readers are referred to the individual papers cited.

*Anoplognathus viridiaeneus*. South-east corner of Queensland and immediate Sydney region (Carne, 1957a). The author also collected this resplendent and rare species south of Nowra, N.S.W. and it would appear that it has a more extensive, although discontinuous, coastal range than previously thought.

*Paraschizognathus ocularis*. Kempsey, N.S.W. (Carne, 1974). This species was found in numbers flying after dusk across wet pasture areas west of Harrington. It appears to exhibit only a slight attraction to light. Carne (1958, 1974) lists the species as occurring in December and January.

*Cheiroplatys salidus*. Paterson, N.S.W. (Carne, 1976).

*Dipelicus duplex*. A discontinuous coastal distribution from Sydney to Brisbane (Carne, 1957b). At Harrington, the larval stages of this species may be associated with beach dunes. Adults have been noted only from lights in close proximity to such dunes and a number of partially emerged though atrophied adults, have been found there.

*Pimelopus dubius dubius* has been recorded from all states except the Northern Territory and New South Wales. This appears to be the first record from New South Wales (Carne, pers. comm.).

*Pimelopus porcellus crassus*. Published records from all states except the Northern Territory and New South Wales (Carne, 1957b). It is interesting to note that in the south of the continent *P. p. crassus* and *P. d. dubius* appear to inhabit a similar geographic range. Their coexistence at Harrington is perhaps not surprising.

*Haploopsis* ? sp., near *rutila*. Published records for this predominantly Western Australian genus have been represented in N.S.W. only by *H. ollifi* Blackburn from Inverell and *H. viridis* Blackburn "New South Wales" (Britton, 1957).

Specimens have been lodged with the Australian National Insect Collection, Canberra.

*Diorygopyx asciculifer* previously recorded from Wingham and the Barrington Tops region (Matthews, 1974). A number of beetles were briefly observed in daytime rolling faecal balls. The beetles constructed ovoid masses, approximately 7 mm x 4 mm, from faecal matter and then proceeded to adopt position 1, the pulling position as described by Matthews (1974), to roll the ovoid. Traps were occasionally placed in cleared grassed areas separating individual rainforest patches and as no specimens were taken in them it would appear that population interchange between rainforest pockets of this apterous species is not of common occurrence.

*Lepanus australis*. Batemans Bay and Clyde Mountain, southern New South Wales (Matthews, 1974).

*Notopedia metallica*. Gibraltar Range National Park (Matthews, 1976). Matthews (1976) does not record any representatives of the genus *Notopedia* further south than Dorrigo, N.S.W.

*Onthophagus waterhousei* has previously been recorded from only montane habitats (Matthews, pers. comm.).

*Onthophagus tabellifer*. Gerringong, N.S.W. (Matthews, 1972). This record is mid way between its previous known range (south coast N.S.W.) and that of the closely related *O. ouratita* Matthews from the south-east Queensland - New South Wales border.

*Onthophagus rubicundulus*. McPherson Range, N.S.W. - Queensland border (Matthews, 1972). Matthews states that the species is not associated with rainforest but Allsopp (1975) has recorded it from rainforest at Ravensbourne in southern Queensland. It has only rarely been encountered in open forest at Harrington, its usual habitat.

The long term stability and continuance of the rainforest at Harrington is open to question. However, it was from these remnant stands that the more notable records have been made. The fragility of these rainforest stands because of their small size gives little hope for the survival of those species known only from this habitat should any residential or tourist development be undertaken within it in the Harrington - Crowdy Head area.

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## A NOTE ON ASPECTS OF THE FLIGHT BEHAVIOUR OF *ANTITROGUS NOX* BRITTON (COLEOPTERA: MELOLONTHINAE)

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In his recent revision of the Australian Melolonthini, Britton (1978) indicated that adult *Antitrogus* species "fly for a very limited period (about ½ hour) at dusk on very few days in the year",

On 27th November 1977, the authors observed large numbers of *Antitrogus nox* Britton flying just before midday at Peats' Ridge, near the species type locality of Gosford, New South Wales. Individuals were seen to fly no more than 1 m above the ground in a slow and somewhat cumbersome manner, and to continue flying for the three or so hours we were in the area. The temperature at the time was approximately 27°C and the sky cloudless.

Vegetation at the site was scattered eucalypt woodland with *Hakea*, *Kunzea* and flowering *Angophora* and *Leptospermum* species dominating the shrub complex. The beetles appeared to stay close to and within an area of thick *Leptospermum* and *Kunzea* bushes. Although slow, their flight was very erratic making netting difficult amongst the foliage.

Visits had been made, in similar weather conditions, to Peats' Ridge on 20th November 1976 and 13th and 20th November 1977, but no flight activity was noticed on these previous occasions.

A small series was taken and a specimen lodged with the Australian National Insect Collection, Canberra.

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